

## WHAT IS CLAIMED IS:

1. A process for producing biodiesel from renewable oil under lipase catalysis in an organic medium reaction system, wherein a short chain alcohol ROH is used as an acyl acceptor, a relatively hydrophilic organic solvent having no negative effect on the reactivity of the lipase is used as a reaction medium, and a renewable oil raw material is catalyzed by a lipase to synthesize biodiesel through a transesterification reaction, characterized in that:

the short chain alcohol and the renewable oil raw material having an alcohol/renewable oil molar ratio of 3:1 to 6:1, together with 20-200% by volume of the organic solvent based on the volume of the renewable oil, and 2-30% by weight of the lipase based on the weight of the renewable oil are added into an enzyme reactor and mixed evenly, the mixture is then heated to 20-60°C to react for 4-24 hours to convert the renewable oil raw material into biodiesel and byproduct glycerin.

2. The process for producing biodiesel from renewable oil under lipase catalysis in an organic medium reaction system as claimed in claim 1, characterized in that:

said relatively hydrophilic organic solvent is selected from the group consisting of tert-butanol and short chain fatty acid ester  $\text{RCOOR}'$ , wherein R and R' are independently an alkyl group having 1 to 4 carbon atoms.

3. The process for producing biodiesel from renewable oil under lipase catalysis in an organic medium reaction system as claimed in claim 1, characterized in that:

said lipase is a microorganism lipase.

4. The process for producing biodiesel from renewable oil under lipase catalysis in an organic medium reaction system as claimed in claim 3, characterized in that:

said microorganism lipase comprises Lipozyme TL, Lipozyme RM, Novozym 435 and mixtures thereof.

5. The process for producing biodiesel from renewable oil under lipase catalysis in an organic medium reaction system as claimed in claim 1, characterized in that:

said renewable oil is a biological renewable oil.

6. The process for producing biodiesel from renewable oil under lipase catalysis in an organic medium reaction system as claimed in claim 5, characterized in that:

said biological renewable oil comprises vegetable renewable oil, animal renewable oil, waste edible oil and residues of refined oil.

7. The process for producing biodiesel from renewable oil under lipase catalysis in an organic medium reaction system as claimed in claim 6, characterized in that:

said vegetable renewable oil comprises castor oil, rapeseed oil, soybean oil, peanut oil, corn oil, cottonseed oil, rice oil, algae oil and mixtures thereof.

8. The process for producing biodiesel from renewable oil under lipase catalysis in an organic medium reaction system as claimed in claim 6, characterized in that:

said animal renewable oil comprises fish oil, lard and mixture thereof.

9. The process for producing biodiesel from renewable oil under lipase catalysis in an organic medium reaction system as claimed in claim 1, characterized in that:

in said short chain alcohol ROH, R is an alkyl group having 1 to 5 carbon atoms.

10. The process for producing biodiesel from renewable oil under lipase catalysis in an organic medium reaction system as claimed in claim 9, characterized in that:

said short chain alcohol is selected from the group consisting of methanol, ethanol, propanol, butanol and pentanol.

11. The process for producing biodiesel from renewable oil under lipase catalysis in an organic medium reaction system as claimed in claim 1, characterized in that:

the molar ratio of said short chain alcohol to said renewable oil is 3:1 to 5:1.

12. The process for producing biodiesel from renewable oil under lipase catalysis in an organic medium reaction system as claimed in claim 1, characterized in that:

the amount of said organic solvent added is 50% to 100% by volume based on the volume of the renewable oil.

13. The process for producing biodiesel from renewable oil under lipase catalysis in an organic medium reaction system as claimed in claim 1, characterized in that:

the heating step is carried out in an automatically thermostatic oscillating shaker.

14. The process for producing biodiesel from renewable oil under lipase catalysis in an organic medium reaction system as claimed in claim 1, characterized in that:  
the reaction temperature is in the range of 30°C to 50°C.